

# SAFETY DATA SHEET

SDS No.6001-0003

Revised date September 8, 2021

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## 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : Reference electrode solution for Diamond electrode  
NAME OF SUPPLIER : GL Sciences Inc.  
ADDRESS : 22-1 Nishishinjuku 6-chome Shinjuku-ku Tokyo 163-1130, Japan  
CHARGE SECTION : International Sales Section  
TELEPHONE No. : +81-3-5323-6620  
FACSIMILE No. : +81-3-5323-6621  
PRODUCT No. : 6001-72300, 6001-72301, 6001-72310, 6001-72321, 6001-72322  
SDS No. : 6001-0003  
Research use only.

## 2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION : Flammable liquids : Category 2  
Acute toxicity - dermal - : Category 3  
Acute toxicity - inhalation - : Category 4  
Serious eye damage/eye irritation : Category 2A  
Specific target organ toxicity  
(Single exposure) : Category 1(Central nervous system,  
Respiratory organs)  
Specific target organ toxicity  
(Repeated exposure) : Category 2(Central nervous system,  
blood system, respiratory organs,  
liver, kidneys)  
Hazardous to the aquatic environment,  
short-term (acute) : Category 2  
Hazardous to the aquatic environment,  
long-term (chronic) : Category 1

HAZARD SYMBOL :



SIGNAL WORD : Danger

HAZARD STATEMENTS :

H225 Highly flammable liquid and vapour  
H311 Toxic in contact with skin  
H332 Harmful if inhaled  
H319 Cause serious eye irritation  
H370 Cause damage to organs(Central nervous system, Respiratory organs)  
H373 May cause damage to organs through prolonged or repeated exposure(Central nervous system, blood system, respiratory organs, liver, kidneys)  
H401 Toxic to aquatic life  
H410 Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS :

[Prevention]

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.  
P233 Keep container tightly closed.  
P240 Ground and bond container and receiving equipment.  
P241 Use explosion-proof equipment.  
P242 Use non-sparking tools.  
P243 Take action to prevent static discharges.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P261 Avoid breathing dust/fume/gas/mist/vapour/spray.  
P264 Wash hands thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.

P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
[Response]	
P302+P352	IF ON SKIN: Wash with plenty of water.
P303+P361+P353	IF ON SKIN or hair: Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P311	IF exposed or concerned: Call a POISON CENTER or doctor.
P312	Call a POISON CENTER or doctor if you feel unwell.
P314	Get medical attention if you feel unwell.
P337+P313	If eye irritation persists: Get medical attention.
P361+P364	Take off immediately all contaminated cloth and wash it before reuse.
P370+P378	In case of fire: Use appropriate medias to extinguish.
P391	Collect spillage.
[Storage]	
P403+ P235	Store in a well-ventilated place Keep cool.
P405	Store locked up.
[Disposal]	
P501	Dispose of contents/container in accordance with all applicable regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL IDENTITY	CONTENT	CHEMICAL FORMULA	CAS No.	TSCA INVENTORY	EINECS No.	EC INDEX No.
Acetonitrile	95.633 %	CH <sub>3</sub> CN	75-05-8	Listed	200-835-2	608-001-00-3
Silver (I) nitrate	0.207 %	AgNO <sub>3</sub>	7761-88-8	Listed	231-853-9	047-001-00-2
Tetrabutylammonium Perchlorate (TBAP)	4.16 %	C <sub>16</sub> H <sub>36</sub> ClNO <sub>4</sub>	1923-70-2	Listed	217-655-5	Not established

4. FIRST AID MEASURES

GENERAL ADVICE	: Consult a physician. Show this safety data sheet to the doctor in attendance.
INHALATION	: Move victim to fresh air. If breathing is difficult, give oxygen. If irritation persists, consult a physician.
SKIN CONTACT	: Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. Consult a physician immediately.
EYE CONTACT	: Flush eyes well with flooding large amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. If possible, remove any contact lenses. Consult a physician immediately.
INGESTION	: Rinse mouth, give plenty of water to dilute the substance. Do not induce vomiting. Never give anything by mouth to an unconscious person. Consult a physician immediately.
GENERAL ADVICE	: Wash off immediately with soap and plenty of water. In the case of respirable dust and/or fumes, use self-contained breathing apparatus and dust impervious protective suit. Use personal protective equipment.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA	: Carbon dioxide, dry chemical powder, foam, water spray
FIRE & EXPLOSION HAZARDS	: Toxic, irritating, dust/fume/smoke may be emitted. Carbon monoxide may be foamed.
SPECIAL PROTECTIVE EQUIPMENT	
FOR FIRE FIGHTERS	: Firemen should wear normal protective equipment(full bunker gear) and positive-pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS : Remove ignition sources and ventilate the area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid raising dust and avoid contact with skin and eyes.
- ENVIRONMENTAL PRECAUTIONS : Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- METHODS FOR CLEAN UP : Do not touch spilled material without suitable protection. Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

- HANDLING : Keep away from ignition sources and ventilate the area —No smoking. In case of insufficient ventilation, wear suitable respiratory equipment.  
Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapour or mist. Avoid prolonged or repeated exposure. Handle this product with suitable protection.
- STORAGE : Store away from sunlight, heat and all ignition sources in well-ventilated dry place Keep cool. Keep container tightly closed.
- INCOMPATIBLE PRODUCTS : Strong oxidizers, acids

8. EXPOSURE CONTROL/PERSONAL PROTECTION

- ENGINEERING MEASURES : Use exhaust ventilation to keep airborne concentrations below exposure limits.  
Use adequate ventilation.
- VENTILATION : Local Exhaust ; Necessary, Mechanical(General) ; Necessary
- PERSONAL PROTECTION
- Respiratory protection : Use respirators approved under appropriate government standards and follow all regulations.
- HAND PROTECTION : Chemical resistant gloves
- EYE PROTECTION : Safety glasses(goggles)
- SKIN PROTECTION : Protective clothing

CONTROL PARAMETERS

CONTENTS	ACGIH TLV-TWA	OSHA PEL-TWA	NIOSH REL
Acetonitrile	20 ppm	40 ppm	20 ppm
Silver (I) nitrate	0.01 mg/m <sup>3</sup> as Ag	0.01 mg/m <sup>3</sup> as Ag	0.01 mg/m <sup>3</sup> as Ag
TBAP	Not established		

9. PHYSICAL AND CHEMICAL PROPERTIES

- PHYSICAL STATE : Liquid
- COLOUR : Colorless, clear
- ODOR : Characteristic odor
- MELTING POINT / FREEZING POINT : -45 °C (MeCN)
- BOILING POINT OR INITIAL BOILING POINT AND BOILING RANGE : approx.82 °C (MeCN)
- FLAMMABILITY : Flammable
- LOWER AND UPPER EXPLOSION LIMIT / FLAMMABILITY LIMIT : 3.0 % (lower), 16.0 % (upper) (MeCN)
- FLASH POINT : 12.8 °C (TCC) (MeCN)
- AUTO-IGNITION TEMPERATURE : 4524 °C (MeCN)
- DECOMPOSITION TEMPERATURE : No data available
- pH : No data available
- KINEMATIC VISCOSITY : Not applicable
- SOLUBILITY
- Water : Miscible
- Organic solvent : Miscible with ethanol, diethylether
- PARTITION COEFFICIENT n-octanol/water (log value) : -0.34 (MeCN)
- VAPOUR PRESSURE : 87 mmHg (at 24 °C) (MeCN)

DENSITY AND/OR RELATIVE DENSITY

: 0.780 - 0.784 (MeCN)  
 RELATIVE VAPOUR DENSITY : 1.4 (MeCN)  
 PARTICLE CHARACTERISTICS : Not applicable

10. STABILITY AND REACTIVITY

REACTIVITY : Stable under recommended storage conditions.  
 CHEMICAL STABILITY : Reacts with strong oxidizers.  
 CONDITION TO AVOID : Sunlight, heat, open flames, high temperature, sparks, static electrical charge, other ignition sources, moisture  
 INCOMPATIBLE MATERIALS : Oxidizers and strong acids  
 HAZARDOUS DECOMPOSITION PRODUCTS : CO, CO<sub>2</sub>, Cyanohydrin, Hydrogen cyanide be formed.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY -oral- : Classification not possible.  
 ACUTE TOXICITY -dermal- : Since all known components are in the same classification category, it falls under category 3.  
 (Acetonitrile) : There are three reports of LD50 values for rabbits of 395 mg/kg (male) (75% aqueous solution), 978.8 mg/kg (male) (undiluted solution) (EHC 154 (1993), EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)), and 3,915 mg/kg (undiluted solution) (EHC 154 (1993), EU-RAR (2002), PATTY (6th, 2012)).  
 Acute toxicity (Inhalation: Gases) : Not applicable  
 Acute toxicity (Inhalation: Vapors) : Not applicable  
 (Acetonitrile) : Based on an LC50 value for rats of 16,000 ppm (female and male) in a 4-hour inhalation exposure test (EHC 154 (1993), EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007), PATTY (6th, 2012)) and LC50 values for rats of 7,551 ppm (male) (converted 4-hour equivalent value: 10,679 ppm) and 12,435 ppm (female) (converted 4-hour equivalent value: 17,586 ppm) (EHC 154 (1993), EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)) in an 8-hour inhalation exposure test, it was classified in Category 4. The category was changed from the previous classification. Besides, since the LC50 values were lower than 90% of the saturated vapor pressure concentration (98,020 ppm), a reference value in the unit of ppm was applied as vapour with little mist.  
 SKIN CORROSION/IRRITATION : Classification not possible.  
 SERIOUS EYE DAMAGE/EYE IRRITATION : Since the total component of eye category 2 is 95.633%, which is above the concentration limit (10%), it corresponds to category 2A.  
 (Acetonitrile) : rabbit: average score: 1.45, conjunctive rubor: 3 (EU-RAR No.18,2002)  
 (AgNO<sub>3</sub>) : Serious damage to human, cause a chemical burn (CICAD 44(2003), ATSDR (1990)).  
 RESPIRATORY SENSITIZATION : Classification not possible.  
 SENSITIZATION : Classification not possible.  
 SKIN SENSITIZATION : Cannot be classified due to lack of data.  
 GERM CELL MUTAGENICITY : Cannot be classified due to lack of data.  
 CARCINOGENICITY : Cannot be classified due to lack of data.  
 REPRODUCTIVE TOXICITY : Cannot be classified due to lack of data.  
 SPECIFIC TARGET ORGAN TOXICITY -Single exposure : Since acetonitrile is 95.633% ≥ 10%, it corresponds to Category 1 (central nervous system, respiratory organs).  
 (Acetonitrile) : As for humans, multiple cases are reported including cases of ingestion of this substance by accident or in a suicide attempt and acute inhalation exposure cases due to accidents in plants. There is a description that acute effects were fatigue, nausea, vomiting, confusion, convulsions, coma, etc., resulting in death in the severe cases (Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)). In addition, there is a report of irritation of the nose and throat by inhalation exposure (Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)). As for experimental animals, there is a report that in a single oral dose test with mice, hypoactivity, tremors, weakness, decreased righting reflex, labored breathing, convulsions, gasping, and salivation were observed at 300-2,000 mg/kg/day

within the range of Category 2 (EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)). In addition, there are reports that hypoactivity, abnormal gait, loss of righting reflex, bradypnea, labored breathing, rapid respiration, gasping, hypothermia, hindlimb extension, lateral position, and yellowing of coat were observed at 3,039-5,000 ppm within the range of Category 2 in a 4-hour single inhalation exposure test with

mice (EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)), and that severe dyspnea, gasping, tremors and convulsions were observed at 500-5,000 ppm (converted 4-hour equivalent value: 250-2,500 ppm, corresponding to within the range of Category 2) in a one-hour single inhalation exposure test with mice (EHC 154 (1993), EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)). Moreover, there is a report that pulmonary hemorrhage and congestion were observed in both surviving cases and death cases in an 8-hour single inhalation exposure test with rats (EU-RAR (2002), Initial Risk Assessment Report (NITE, CERI, NEDO, 2007)). Although there was no detailed description of doses in this study, LC50 values (converted 4-hour equivalent value) were reported to be 10,678 ppm (male) and 17,585 ppm (female), and it is considered that effects were observed at doses within the range of Category 2. From the above information, it is considered that this substance affects the central nervous system and respiratory organs. Therefore, it was classified in Category 1 (central nervous system, respiratory organs).

SPECIFIC TARGET ORGAN TOXICITY - repeated exposure -

- (Acetonitrile) : Since acetonitrile is 95.633%  $\geq$  10%, it falls under Category 2 (central nervous system, blood system, respiratory system, liver, kidney).
- (Acetonitrile) : No information on humans is available. As for experimental animals, in a 13-week inhalation toxicity test (6 hours/day, 5 days/week) with rats exposed to the vapour, at or above 800 ppm (1,340 mg/m<sup>3</sup> (converted guidance value: 0.97 mg/L)) within the guidance value range for Category 2, deaths, hypoactivity, rough fur, decreased thymus weight, anemia symptoms (decreases in erythrocyte count, hemoglobin concentration and hematocrit value) were found, and in death cases, pulmonary congestion and edema, hemorrhage in the pulmonary alveoli and brain, decreased bone marrow cells, thymic atrophy, decreased lymphocytes in the spleen, and decreased corpora lutea in the ovary were observed (Initial Risk Assessment Report (NITE, CERI, NEDO 2007), Environmental Risk Assessment for Chemical Substances Vol.3 (Ministry of the Environment, 2004), NTP TR 447 (1996)), and in a 90-day inhalation toxicity test (7 hours/day, 5 days/week) with rats exposed to the vapour, atelectasis and histiocyte clumps in the alveoli at or above 166 ppm (279 mg/m<sup>3</sup> (converted guidance value: 0.33 mg/L)) within the guidance value range for Category 2, and bronchitis and pneumonia at or above 330 ppm (554 mg/m<sup>3</sup> (converted guidance value: 0.65 mg/L)) were observed (Initial Risk Assessment Report (NITE, CERI, NEDO, 2007), EU-RAR (2002)). In addition, in a 13-week inhalation toxicity test (6 hours/day, 5 days/week) with mice exposed to the vapour, increased liver weight at or above 100 ppm (168 mg/m<sup>3</sup>) (converted guidance value: 0.12 mg/L)
- (AgNO<sub>3</sub>) : Human: Effect to upper respiratory system in manufacturing factory (ATSDR(1990), ACGIH(7th,2001)).

ASPIRATION TOXICITY : Classification not possible due to lack of data.

12. ECOLOGICAL INFORMATION

Hazardous to the aquatic environment - Acute hazard -

- (AgNO<sub>3</sub>) : (Toxic multiplier x 10 x Category 1) + Category 2 is 207.000%, which corresponds to Category 2 because it is above the concentration limit (25%).
- (AgNO<sub>3</sub>) : Daphnia magna; EC50=0.0009 mg/L, 48h(corresponding value)(CICADs 44,2002)

Hazardous to the aquatic environment - Chronic hazard -

- (AgNO<sub>3</sub>) : Category 1 x Toxicity multiplier is 95.840%, which corresponds to Category 1 because it is above the concentration limit (25%).
- (AgNO<sub>3</sub>) : Rainbow fish; LOEC=0.00016 mg/L,60D (CICADs 44,2002)

BIODEGRADABILITY : (MeCN) 1.00 x 10<sup>6</sup> mg/L(PHYSPROP Database,2005)

BIOACCUMULATIVE POTENTIAL : (AgNO<sub>3</sub>) BCF=600 (Existing Chemical Substances Safety Evaluation Data)

MOBILITY IN SOIL : No data available

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**HAZARDOUS TO THE OZONE LAYER**

: Substances included in this mixture are not listed in Annexes to the Montreal Protocol.

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**13. DISPOSAL INFORMATION**

Dispose in a hazardous-waste site in accordance with all applicable regulations. Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environment agency for specific rules).

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**14. TRANSPORT INFORMATION**

## International Regulations

Marine regulatory information : Comply the provisions of IMO.

UN No. : 1992

Proper Shipping Name : FLAMMABLE LIQUID, TOXIC, N.O.S. (ACETONITRILE SOLUTION)

Class : 3

Sub Risk : 6.1

Packing Group : II

Marine Pollutant : Not applicable

Aviation regulatory information : Comply the provisions of ICAO/IATA.

UN No. : 1992

Proper Shipping Name : Flammable liquid, toxic, n.o.s., (Acetonitrile solution)

Class : 3

Sub Risk : 6.1

Packing Group : II

Emergency Response Guide Number : 129

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**15. REGULATORY INFORMATION**

For classification and labeling of chemicals in accordance with the applicable rules and regulations in the EU or each country, refer to GHS classification of this product (See Section 2).

US REGULATION : OSHA HCS 2012/29 CFR 1910.1200

EU REGULATION : CLP Regulation ((EC) No. 1272/2008)

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**16. OTHER INFORMATION****NOTICE:**

The information contained in the SDS description is applicable exclusively to the chemical substance identified herein and for its intended use as an analytical reference standard or reagent and to the unit quantity intended for that purpose. The information does not relate to, and may not be appropriate for, any application or larger quantity of the substance described. Our products are intended for the use by individuals possessing sufficient technical skill and qualification on use the material potential hazardous chemical. Accordingly, no representation or warranty, express or implied, with respect to merchantability and fitness for a particular purpose is made with respect to the information contained herein.

**Attention:**

This product in terms of chemical identity and the unit amount provide is intended for use in chemical analysis and not for human consumption, nor any other purpose.